

all his remarks had been addressed to a question which had not been debated at all—the question of conveyance. In the Thames Valley the question was not one of conveyance, but of ultimate disposal to the sewerage. By some speakers they were asked to adopt the pan system because of a few trifling private experiences of private individuals, and to forget that 900,000 houses in London had been fitted with water-closets drained into sewers, causing the death rate to decrease from 28 to something less than 20 per 1,000. Mr. Grant was quite correct in attributing the fever at Croydon to pipes, but it was to water pipes, not drain pipes. The fever was most distinctly traceable to imbibing poisonous water, and Croydon was now one of the most notorious successes of the drainage system. Regarding the water question, he defied anyone to prove that 65 gallons a day was used without the most extravagant waste. He desired to point out that sewer gas was never generated in running sewers, but only in stagnant sewers. The gas never generated where water was running at the rate of $2\frac{1}{2}$ ft. per second, and one in 300 ft., or one in 250 ft., would give that flow. In Hobart it was impossible to get so flat a grade as that except very near the exits. Adelaide was unfavourably situated in this respect, and the people there were put to large expense in consequence. Faults in ventilation had been made, but they had been remedied by ventilating shafts, etc., and those who were strongest against it were now most in favour of the underground system in Adelaide. He had considerable experience in sanitary matters, but he never in all his experience came across such an excellent body of by-laws as those drawn up in Adelaide. In that city when the drainage works were commenced the population was 41,241, and the deaths from preventable diseases amounted to 4.14 per thousand; when while the works in 1885 were completed the population was 43,969, and the deaths from preventable diseases was 1.52 per thousand—a saving of 113 lives. In Hobart, taking the registration area, the population was 28,648 in 1881, and the deaths from preventable disease was 2.06; and in 1885, with a population of 29,987, the death rate from the same causes was 2.53. Hobart should not rest content with being in as favourable a condition in sanitary matters as other cities; it should be above all from its natural position and facilities for becoming such. He did not expect to see his scheme adopted without opposition. He knew there were many points for consideration about which he was desirous of knowing more; but he advocated it as the best that could be adopted for the health of the city.

On the motion of Mr. C. J. ATKINS, seconded by Mr. C. H. GRANT, a vote of thanks was passed to Mr. Mault for his valuable paper.

OCTOBER, 1886.

The usual monthly evening meeting was held on Monday, October 11, at the Society's rooms, Mr. James Barnard in the chair. There was a good attendance of Fellows, and a number of visitors.

Very Rev. Chas. Leslie Dundas, Dean of St. David's, and Mr. H. B. Bruford, Hobart, were elected Fellows of the Society.

The following donations to the library were announced:—

American Agriculturist, September.

Annals and Magazines of Natural History, vol. 18, No. 104, August. Athenæum.

Catalogue of Australian Land Shells, by J. C. Cox, M.D. Catalogue of Minerals and Rocks in the Australian Museum, by Gerard Krefft. Exchange list of Land and Marine Shells from Australia and the adjacent islands. By J. C. Cox, M.D.—From J. Brazier, C.M.Z.S.

Geological Magazine, August.

Imperial Federation, August.—From the Editor.

Journal of the Society of Arts, July.

Journal of the Royal Microscopical Society. Ser. II., Vol. VI., Pt. 4, August.

List of the Mollusca in the collection of the British Museum, Pt. II, Olividae By J. G. Gray.—From J. Brazier, C.M.Z.S.

Monthly notices of the Royal Astronomical Society, Vol. XLVI., No. 8, June.—From the Society.

Nature, July.

“Note on an experiment by Chladni.” “On the Bleaching of Iodide of Starch by means of Heat.”—By Chas. Tomlinson, F.R.S.

Proceedings of the Queensland Branch of the Geographical Society of Australasia, 1st session, 1885-6. Vol. I.—From the Society.

Prodromus of the Zoology of Victoria, or figures and descriptions of the living species of all classes of the Victorian Indigenous Animals. Decade XII., by Prof. F. McCoy, F.R.S.—From the Society.

Records of the Geological Survey of India, vol. xix., part 3.—From the Society.

Remarks on a new theory of Dew, by Chas. Tomlinson, F.R.S.

Reports on the results of dredging, under the supervision of Alexander Agassiz in the Gulf of Mexico (1877-80), and in the Carribbean Sea (1879-80), by the U.S. Coast survey steamer Blake, xxviii.

Description of 13 species and two genera of Fishes from the Blake collection, by G. Brown Goode, and Tarleton H. Bean, vol. xii., No. 5. From Alexander Agassiz.

Reports of the Mining Registrars for the quarter ended 30th June, 1886.—From the Government.

Société de Géographie, No. 14, 15, 1886.—From the Society.

Statistical Register of the Colony of Victoria for the year 1885, Pt. IV.—“Vital Statistics.”—From the Department.

Transactions of the Geological Society of Australasia, Vol. I. pt. (Victoria).—From the Society.

Victorian Naturalist, Vol. III., No. 5, September.—From the Society.

NEW MEMBERS.

The CHAIRMAN stated that the name of Hon. James Smith, M.L.C., would be submitted for election at next meeting. Mr. Smith had received the distinction of being made a member when Sir Henry Lefroy was president, but had some scruples about accepting the position, which had since been removed. He thought it would be a great pleasure on the part of the Fellows to do honour to the discoverer of Mount Bischoff.

PAPERS.

Mr. R. M. JOHNSTON, F.L.S., read a paper, entitled—“Fresh contribution to our knowledge of the Plants of Mesozoic Age in Tasmania.” Mr. Johnston, in opening his paper, stated that “certain beds of grey shales have recently been exposed at Lord’s Hill, New Town, by Mr. Dorman, builder, who kindly afforded me every facility for their examination. These beds are intimately associated with the beds containing the coal seams at New Town, and as they were full of impressions of plant remains, I spent a considerable time in making collections and in thoroughly examining the numerous forms. The results have far surpassed my utmost expectation, for in the following pages I shall be able to show that about 15 forms of great interest, new to

science, have been added to the list of the Mesozoic plants of this island. The cycadeous and coniferous plants especially are very important, and are fully discussed under the section where they are specifically classed and described. The coniferous genus *Baiera* is of more than ordinary interest, as I was fortunate in obtaining both the male and female fructification attached to the pedicels of the plants, which are very numerous in these shales, and share with *Thinnfeldia odenopteroides*, Morris; *Alethopteris Australis*, Morris; *Neuropteris Tasmaniensis*, Johnston; *Pterophyllum Strahani*, Johnston; and *Sagenopteris salisburyioides*, Johnston, in being the most abundant and typical of the numerous forms of plants occurring in great perfection in the shaly beds at the place indicated. The following is a more complete list of the species observed by me at this place, all of which were obtained within the space of a few yards in width and one or two feet in depth. It will be seen that the new discovery forms a very important addition to the already known plants of the period." Mr. Johnston was of opinion that Australian geologists should refuse to adopt the European classification so far as sub-divisions of systems are concerned. He gave several striking reasons for his contention, one of which was from Tasmanian rocks of the Miocene age, where a vegetation consisting of oaks, elms, beeches, alders, laurels, etc., prevails, showing a closer resemblance to the existing vegetation of Europe than is exhibited by the existing vegetation of Tasmania. Proceeding, he urged "With these facts and considerations before us, I cannot but express my strong conviction that it would be unwise to accept the triple subdivision of *Triassic*, *Jurassic* and *Cretaceous* for the Mesozoic rocks of Australia and Tasmania, as such triple subdivision does not in the remotest degree harmonise with the local facts of either stratigraphy or palæontology. In Tasmania there is no break showing alternation of sea and land throughout the whole series of formation belonging to the Mesozoic period, and typical specific forms persist throughout all the separate groups which from their extent indicate a vast period of time. The great sameness of forms of vegetable life presents a great difficulty in breaking up our scattered formations of this age into geological subdivisions, and I at least am as yet far from prepared to indicate any satisfactory lines whereby the whole series could even be separated into superior and inferior groups. In time, when the distribution of certain forms can be more exactly determined, such a simple method of grouping, having a local significance, may be adopted with advantage; but in the meantime I am convinced that it is only on the broad lines of systems that we can suggest parallels with European and other distant regions." A complete description of 15 new species, with illustrations, accompanied this excellent paper; also a table showing, approximately, the known distribution in time of genera of plants occurring in the Upper Palæozoic and Mesozoic rocks of Australasia.

Mr. E. SWAN said the fact that Mr. Johnston had discovered fifteen new species spoke a great deal for his power of research, because the excavations for wells and houses on the other side of the road at Swan's Hill exhibited a similar formation, specimens from which had been submitted to different *savants* here.

Mr. JOHNSTON said that was quite excusable, as those who dealt with the matter before were simply collecting specimens, and he did not know of any local person who had hitherto worked closely at the plants and their classification. They had mostly been satisfied with making a collection for the Museum, and many of the specimens had been collected by unscientific persons, who were naturally attracted by the more beautiful impressions. A very beautiful slab of impressions submitted to him contained only one species, and that was not new. It was only by careful work, frequently among the most insignificant

fragments, where he obtained traces, which led him to hunt till he obtained more perfect specimens, that he had been able to collect what he had submitted. The fragments collected by Dr. Milligan and others had assisted him greatly by causing him to be watchful to discover more perfect representatives of certain plants of which imperfect fragments already existed in the Museum.

The SECRETARY read a paper on "The Tin Ore Deposits of Mount Bischoff, Tasmania," by Baron A. V. Groddeck, which had been translated by Dr. Wolfhagen, and was a continuation of a similar paper read in 1884.

Mr. SPRENT said it appeared that the Baron had received an impression that the Society had doubted the correctness of his determination of the rock referred to. This was not so, for the discussion which had taken place on the previous paper was as to which of the many porphyries the one described by the Baron as topaz belonged. There were a great many porphyries at Bischoff, so it would be advisable to write to the author of the paper and ask if he would kindly send some small fragments of the rock, to be compared with those in the Museum. Neither Mr. Kayser nor Mr. Smith knew exactly which rock it was, and Mr. Kayser thought it had been covered up by some tailings. The rock varied so much that it would take an experienced mineralogist to tell which was the one. If they had only retained type specimens to refer to, the question might be settled, and there was no better school in the world to refer to than Clausthal, and if the Baron was communicated with the point might be settled.

The SECRETARY said he had written to Mr. Thureau, asking him if he would kindly forward to the Museum the microscopical specimens of the rock. With regard to specimens from Mount Bischoff, Mr. Kayser had promised to make a complete collection of the rocks of the Mount Bischoff district, and forward them to the Museum.

Mr. SPRENT said it was a great pity the Museum was not furnished with a better collection of mineralogical specimens of Tasmania. He suggested that Mr. Morton should go through the country next summer and make a collection for the Museum. The surface specimens at Bischoff were getting more difficult to obtain every year, and if they were not secured soon they would not be obtainable at all.

Mr. JOHNSTON agreed with Mr. Sprent that in sending specimens away it was desirable to retain types, and have the specimens numbered, so that it could be seen which were referred to.

Mr. F. ABBOTT read a paper entitled "Notes on a recent case of poisoning by *Rhus radicans* exhalation at the Botanical Gardens." Mr. Abbott pointed out the habits of the plant, which is indigenous to North America, and described how five men were poisoned, two of which cases were serious ones, while engaged in cutting down the plant and taking it away to be burnt up. He had never known the plant to injure anyone before, and though he was present on the occasion referred to and handled the plant he was not affected by it. The latter fact he could not account for, but he thought the plant was more noxious at certain seasons than at others. Moreover it was well authenticated that it affected some people more than others, and was most injurious to people of a nervous or irritable temperament.

Dr. C. E. BARNARD thought Mr. Abbott had brought a very interesting matter forward with a good deal of botanical information. He was not aware it was the poison in question that had affected these men, or that the tree was here. He had heard of it before at San Francisco; but when he first saw these men similarly affected on the arms and face, he at first inclined to the opinion that it was a case of poison-

ing resulting from tatooing—a practice he believed these men indulged in in their hours of rest. In San Francisco he accidentally heard of some officers of one of Her Majesty's ships who were going to give a party on board their vessel and were anxious to have it decorated. With that end in view they procured the first green boughs they could find, and were pleased to get something so exactly suited to their purpose for decoration. They were considerably surprised, however, when the ladies came on board and refused to enter a place so admirably decorated. Several of the officers themselves who decorated the place were laid up for a long time afterwards. When the men referred to in the paper were brought to him he thought it looked like a case of blood poisoning. He could hardly think it was an emanation from the plants which poisoned, but inclined to the belief that it was that the poisoning proceeded from the milky exudation from the plants when cutting them, which had been smeared on the arms and face. The symptoms described were certainly akin to erysipelas, which in effect it was. It was a very singular plant, and it was interesting to have Mr. Abbott's account of it.

Mr. ABBOTT pointed out that in one case the irritation broke out on the abdomen and over most of the body.

Dr. WOLFHAGEN said he was inclined to the belief that the symptoms described were a kind of eczema, which was similar at first to an attack of erysipelas. The plant had fine hairs, and it might be possible that these hairs caused the irritation and inflammation, and the skin of face and arms being more delicate, was consequently more liable to attack. According to the latest authorities, erysipelas was supposed to be due to a poison germ. The sufferings of these men might be due to the mechanical irritation of the hairs described, or to the presence of the erysipelas germ in the plant. The discovery of the latter hypothesis would be extremely interesting.

Mr. WARD suggested that the poison had emanated from the plant, as it was burning and was an acrid juice distilled from it by heat. If it was due to the juice of the plant the hands would have been affected. Mr. Abbott's immunity might be due to the difference between his diet and the prison fare.

Mr. JOHNSTON said he had examined the plant, and did not find any hairs that would come readily from it.

Dr. BARNARD said a poison had been extracted from the plant known as toxicodendric acid.

The SECRETARY read several cases to show that the plant did not have the same effect on all people, its effect varying in different constitutions.

Mr. J. B. WALKER related a very unpleasant experience he had after culling a common purple creeper, *dolicos pruriens*, which has a quantity of irritant fibres at the ends of the seed vessels. The effect was an intolerable itching for some time, and an excessive thickening of the skin.

Dr. PERKINS said the subject had been almost exhausted. He believed the plant was collected for medicinal purposes at night time, thus proving that it was the emanation from the plant was capable of producing the disease of toxic poisoning. The poison attacks the nervous system, and was similar in symptoms to strychnine. It was a powerful agent, and had been used with more or less effect in paralysis. He quite agreed with Mr. Abbott that its effect would be greater on nervous or irritable people, and attributed Mr. Abbott's escape to his phlegmatic temperament.

Mr. WARD said there were instances of total blindness having been caused by the juice of this plant being rubbed into the eyes.

Mr. ABBOTT, in reply to the theory that it was the action of the fire upon the plant that caused the poison to distil, pointed out that the man who suffered most had not been near the fire, nor did the diet question come in, for two of the men who suffered were men employed in the gardens who were not on low diet.

Dr. PERKINS pointed out the common error of supposing that the upas tree had a deadly exhalation. The deadly nature of the valley in Jarra commonly thought to be caused by the upas tree resulted from carbonic acid gas, which rose from the earth, and nothing lived in that valley, not even the upas tree itself.

Mr. J. R. McClymont read a paper entitled "History of Australian Geography, II. Tasmania and New Zealand, on the Dauphin and other MS. maps." Mr. McClymont prefaced his paper by a brief account of the first Portuguese voyages to India—those of Vasco de Gama and Cabral—drawn from Mr. Major's "Prince Henry the Navigator." He adduced arguments tending to indicate that the discovery of some part of Australia might have been made by some of Cabral's ships, scattered as they were by a hurricane off the Cape of Good Hope, and quoted a passage from Mercator in support of this possibility.

MICROSCOPE.

Mr. C. J. ATKINS exhibited, by the aid of the microscope, some very interesting living specimens of Cyclops, a genus of minute Entomostracous Crustaceans of the order Branchiopoda, having a soft and rather gelatinous body divided into two portions, one consisting of the head and thorax, and the other forming the tail. Under the microscopes the animal was of a very bright colour, sparkling like a gem. They appeared, under an inch objective, very active, and dart about with great rapidity. The species Cyclops are very numerous, inhabiting both the sea and fresh waters. Great interest was taken in the specimens by the members present.

On the motion of Mr. Justin McC. BROWNE, a vote of thanks was unanimously accorded the writers of the papers.

NOVEMBER, 1886.

The monthly meeting of this society (the last of the session of 1886) was held on Monday evening, November 22, when a number of interesting papers were read, and the vice-president delivered his closing address. The vice-president, Mr. James Barnard, presided, and there was a large attendance of Fellows, including the hon. the Premier (Hon. J. W. Agnew, M.D., M.E.C.), Hon. P. O. Fysh, and several ladies.

Messrs. C. P. McCarthy and S. Glassbrook, of England, were introduced as visitors.

Dr. Gray, of New Norfolk, was elected a Fellow of the Society.

The assistant secretary (Mr. A. Morton) laid on the table the usual returns.

List of additions to the library during the month of October:—

Annals and magazines of Natural History, No. CV., Vol. 18.

Annual Report of the Department of Mines, New South Wales.—From the Government.

Bollettino della Società Geografica Italiana. Series II., Vol. XI., Fasc. 8, 9.—From the Society.

Boletim da Sociedade de Geographia de Lisbon. 6A serie, No. 1—2.—From the Society.